

# Underrecording of Infant Homicide in the United States

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**Abstract:** Homicide rates for infants dropped suddenly between 1967 and 1969. The abrupt nature of this decline suggested the change was artifactual. Investigation suggests that two classification revisions instituted at this time were causes of this decline: changes in related codes set forth in the Eighth Revision of the International Classification of Diseases, Adapted, and revision of the standard certificate of death in 1968. Infant homicides may have been disproportionately underrecorded after 1968. (*Am J Public Health* 1983; 73:195-197.)

## Introduction

In 1978, homicide was one of the five leading causes of death for all persons 1 through 44 years of age and infant homicide rates were comparable to infant mortality rates from viral diseases,\* neoplasms, and antepartum or intrapartum infection.<sup>1</sup> Infant homicide accounted for approximately 10,600 years of potential life lost in 1979 alone. Furthermore, the rates for infants may be underestimates since forensic and pathologic literature suggest that homicide is especially difficult to ascertain in infants.<sup>2-4</sup> We compared infant homicide rates to those for other age groups for the United States between 1960 and 1976.

## Materials and Methods

National homicide rates were obtained from separate volumes of the *Vital Statistics of the United States* (1960-1976)<sup>5</sup> and from unpublished data from the National Center for Health Statistics (NCHS). Classifications discussed are described in the Seventh and Eighth Revisions of the International Classification of Diseases Adapted (ICDA) coding.<sup>6,7</sup> In the Seventh Revision, homicides were coded as E964, E980-E985. In the Eighth Revision, comparable homi-

cide categories were E960-E978, and a new category "Injury undetermined whether accidentally or purposely inflicted" (E980-E989) was created.\*\* New York State data were kindly supplied by the State Department of Health, Office of Public Health, Office of Biostatistics. Statistical analysis was done using the Mantel-Haenszel chi-square technique.<sup>8</sup>

## Results

Selected age-specific homicide rates for 1960-1976 and the overall homicide rates are shown in Figure 1. Homicide rates increased between 1960 and 1973 for all age groups whose members were more than 1 year old. For those less than 1, the rate declined precipitously by 25 per cent in 1968. This decline continued through 1969 and stabilized in 1970. The homicide rate for those less than age 1 increased between 1970 and 1976, with the slope closely paralleling that for this age group in 1960-1967. This pattern of infant homicide rates for 1960-1976 was not sex- or race-specific.

Investigation and consultation with NCHS showed that two classification changes pertinent to homicide coding were instituted in 1968. The first change was the addition of the ICDA category "Injuries undetermined whether accidentally or purposely inflicted." Figure 2 shows rates of homicide and of this new category for infants in 1960 through 1976. When these rates are summed, the combination closely approximates the trend in infant homicide rates seen in 1960 through 1967.

Comparability analysis done by NCHS indicated a ratio of 0.9969 for the category "Homicide" between the Seventh and Eighth Revisions.<sup>9\*\*\*</sup> However, the analysis was not done for specific age groups, nor was the sampling procedure age-specific (personal communication, NCHS).

A similar comparability study was done in the State of New York, and some age-specific information was obtainable from this study. Therefore we used New York State data in a comparability analysis for infants and for those  $\geq 1$  year of age for the coding "Homicide".

For infants, five of the 15 deaths coded as "Homicide" using the Seventh Revision codes were coded as "Injury undetermined whether accidentally or purposely inflicted" using the Eighth Revision coding, seven were coded as "Homicide", and three were placed into other categories. This gives a comparability ratio of 46.7 per cent for infants. For all other ages, only 4 per cent of all deaths on this list coded as "Homicide" using the Seventh Revision codes

\*Excludes influenza and diarrheal illness.

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\*\*The Ninth Revision classifications came into use in 1979.

\*\*\*The comparability ratio was computed by dividing the estimated number of 1966 deaths assigned to the Eighth Revision category "Homicide" by the number of 1966 deaths assigned to the Seventh Revision category "Homicide."

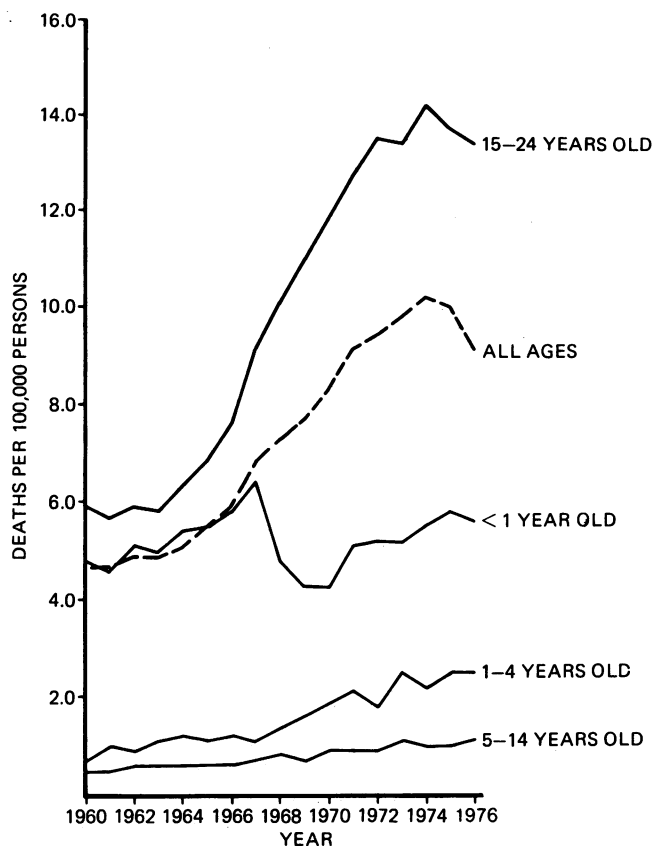


FIGURE 1—Homicide Rates for Selected Age Groups by Year and All Ages by Year, United States 1960–1976

were coded as “Injury undetermined whether accidentally or purposely inflicted” using the Eighth Revision coding, 95 per cent were coded as “Homicide”, and 1 per cent were placed into other categories. This gives a comparability ratio of 94.8 per cent for all persons  $\geq 1$  year old.<sup>‡</sup> Thus, for New York State, the creation of the new category “Injury undetermined whether accidentally or purposely inflicted” had a substantial effect upon the coding of homicide for infants. This effect differed significantly from the minor effect seen for all other ages ( $p < .001$ ). Unfortunately, we cannot be certain that these New York State data are representative of the United States as a whole, since this state differed significantly from the nation as a whole in its ratio of deaths from “Injury undetermined whether accidentally or purposely inflicted” to deaths from “Homicide.”<sup>‡‡</sup>

<sup>‡</sup>Percentage for noninfants calculated on the basis of a 25% sample of all noninfant deaths coded as “Homicide” or “Injury undetermined whether accidentally or purposely inflicted” using the Eighth Revision.

<sup>‡‡</sup>For 1968, New York State and the United States figures compared as follows:

No. Homicides/No. Undetermined	Infants		$\geq 1$ year old	
	NYS	US	NYS	US
	0.3	1.7	1.0	3.5

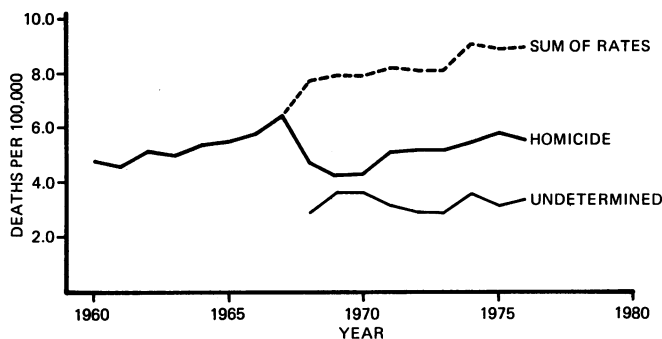


FIGURE 2—Death Rates from Homicide and Deaths Undetermined Whether Homicide or Accident for Infants Less Than One Year Old by Year, United States, 1960–1976

The second revision was in the standard certificate of death itself. A new format was approved in 1968.<sup>10</sup> Prior to this change, each certificate included a box or boxes marked “Accident, Suicide or Homicide.” One of these was to be indicated if appropriate. For the new certificate, the category “Undetermined” was added. Not all states adopted the new certificate in 1968, but the changeover was generally complete within two years (personal communication, NCHS). When this “Undetermined” category was marked, abstractors were instructed to classify the death into the ICDA category “Injury undetermined whether accidentally or purposely inflicted.” Persons completing death certificates are reportedly often unaware of changes in ICDA coding (personal communication, NCHS); the addition of the “Undetermined” category to the certificate of death provided a readily apparent means for them to avoid a definite diagnosis of homicide. Thus, the continued decline of the infant homicide rate in 1969 and its stabilization in 1970 may have been associated with state adaptation of the new certificate format.

## Discussion

We suggest that the sharp decline in infant homicide rates between 1967–1969 was at least in part artifactual and associated with coding and certificate changes occurring in 1968. Infant homicides are thought to be underreported due to ascertainment difficulties and reporter unwillingness to consider homicide as a diagnosis.<sup>2–4</sup> With the described combination of revisions, recorders now had an alternative to coding an infant death as homicide. The marking of the “Undetermined” category on the certificate of death eventually caused that death to be classified into the ICDA category “Injuries undetermined whether accidentally or purposely inflicted.” Unfortunately, we are unable to determine the exact proportion of United States infant deaths coded to “Uncertain” causes that represents deaths which would otherwise have been coded to “Homicide.” The New York State data are not sufficiently comparable to the United States data to permit such an estimate; however, it is fair to assume that the sum of cases now coded as “Undeter-

mined" and coded "Homicide" cases would be somewhat less than the total of "Homicide" and "Undetermined" shown in Figure 2.

If the sudden drop in infant homicide rates during 1968–1969 is artifactual, it could reflect either a correction in previous over-diagnosis or the initiation of greater under-diagnosis. The former possibility cannot be disproven, but seems unlikely for two reasons. First, as discussed above, examiners are reluctant to diagnose homicide in infants. Second, articles on violence against children were rare prior to and during the 1960s and awareness of this problem did not spread widely into the medical or lay community until the 1970s.<sup>11–14</sup> We, therefore, favor the second possibility and suggest that recorded homicide rates probably underrepresent infant homicide for the period in which the discussed revisions were used, i.e., between 1968–1978.

Recorded homicides of infants comprise only a small proportion of homicides registered as occurring in the United States. It is therefore not surprising that effects of changes in homicide coding upon this age group would be inapparent when only the effects upon overall homicide rates were examined.<sup>9</sup> However, both vital statistics and law enforcement data indicate that the first year of life is a peak age for child homicide.<sup>5,15</sup> Persons interested in infant mortality should be cautioned about the effects of these revisions upon their assessment of homicide as a cause of death.

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